

*Bose® Panaray® LT Series III Loudspeakers*

Reference Guide

***BOSE***®





## **Declaration of Conformity**

We, the offerer:

Bose Corporation, The Mountain, Framingham, MA 01701-9168 USA

acknowledge our sole responsibility, that the product:

**Kind of equipment:** Loudspeaker  
**Type designation:** Panaray® LT 3202® III Loudspeaker System  
Panaray LT 4402® III Loudspeaker System  
Panaray LT 9402™ III Loudspeaker System  
Panaray LT 9702® III Loudspeaker System  
Panaray LT MB24 III Modular Bass Loudspeaker System

in accordance with EMC Directive 89/336/EEC and Article 10(1) of the Directive,

is in compliance with the following norm(s) or document(s)

**Technical regulations: EN55103-1, EN5103-2**

Accredited by Bose Corporation

18 June 2004

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## Safety Information

Please read this safety information before installing, connecting, or operating the Bose® Panaray® LT loudspeakers.

### **Read the instructions.**

Read and keep all safety and operating instructions for future reference, including this manual.

### **Follow cautions.**




For your safety, follow all cautions and warnings in this manual and on the units.

### **Protect cables.**

Always route cables to avoid pinching or cutting by heavy or sharp objects.

### **Follow the mounting guidelines.**

Mount the loudspeaker cabinets according to the instructions in the Mechanical Specifications section of this manual. Failure to do so may result in permanent damage to the system components or physical injury to anyone near the system.

-  **WARNING:** *This system is capable of supplying extremely high sound pressure levels (SPL).*
-  **WARNING:** *The rear of the Panaray LT loudspeakers can become very hot during normal use. Do not attempt to service or move an LT loudspeaker until the rear of the loudspeaker has cooled. Turn down volume and turn off the power amplifier before connecting the loudspeaker.*
-  **WARNING:** *All Panaray LT loudspeakers require active equalization. Do not operate the loudspeakers without the proper active equalization for the particular loudspeaker and operating configuration. Failure to do so may result in permanent damage.*

## Mounting Guidelines

**▲ WARNING:** The Panaray® LT Series loudspeakers must be attached to brackets or other mounting surfaces for permanent or seasonal use. Such mountings, typically in overhead locations, involve risk of personal injury if either the mounting system or the loudspeaker attachment fails. Installation of the mounting system must be performed in accordance with all applicable building codes including local codes. Consult the local authority before installing this product.

The LT loudspeaker installation requires the use of either Bose® or non-Bose mounting products. While Bose Corporation cannot be held responsible for the proper design and use of non-Bose mounting systems, we offer the following information and guidelines for the permanent installation of your Panaray LT loudspeakers:

- Obtain your mounting system from a reputable manufacturer. Select a system design that works for your loudspeaker and its intended use.
- Before using a custom-designed mounting system, have a licensed professional engineer review the design and fabrication for structural integrity and safety in the intended application.
- The threaded attachment points on the top, bottom, and sides of each loudspeaker have an SAE  $\frac{3}{8}$ -16 inch thread with at least 18 usable threads.
- Lock washers or a locking compound intended for hand disassembly (such as Loctite 242) should be used for a vibration resistant assembly.
- Use a safety cable, separately attached to the cabinet, at a point not in common with the load-bearing attachment points of the mounting system to the loudspeaker. This is recommended even if not required by local regulation. If you are unfamiliar with the proper design, use, and purpose of a safety cable, consult a licensed professional engineer or a rigging professional.
- Additional loudspeakers may be suspended below the Panaray LT loudspeaker provided that:
  - It employs all 8 threaded-insert hang points on the top and bottom to fly and suspend the loudspeakers.
  - The total weight of suspended loudspeakers and the Panaray LT loudspeaker does not exceed the working load limit (WLL) listed below:

LT 3202®-III Loudspeaker = 395 lb (179 kg)	LT 4402®-III Loudspeaker = 299 lb (135 kg)
LT 9402™-III Loudspeaker = 261 lb (118 kg)	LT 9702®-III Loudspeaker = 381 lb (173 kg)
LT MB24-III Loudspeaker = 520 lb (236 kg)	

**▲ CAUTION:** Use only graded hardware. Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum. Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties. Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

**▲ CAUTION:** The fasteners should be tightened **using torque not to exceed 50 pounds.inch (5.6 Newton-meters)**. Over-tightening the fastener could result in irreparable damage to the cabinet and create an unsafe assembly.

**▲ CAUTION:** The fastener should be long enough to engage **no fewer than 16 threads of the attachment point**. Using a fastener that is too short provides inadequate holding power and may strip the mounting threads, resulting in an unsafe assembly. Confirm that at least 16 full threads are engaged in your assembly.

**▲ CAUTION:** Do not attempt to alter the threaded attachment points. Do not attempt to re-thread the attachment points to accommodate any other thread size or type; doing so will compromise the safety of the installation while permanently damaging the loudspeaker.

## *How to Use This Reference Guide*

The reference guide is divided into several sections. Below is a listing of each section and a brief description of what is contained in each section:

**Mechanical Specifications** — This section gives mechanical drawings, dimensions, weights, center of gravity, insert locations, and load ratings for each cabinet. This is intended to provide the information necessary for a qualified installer to suspend or mount the loudspeakers.

**Acoustic Specifications and Wiring Information** — This section provides acoustic specifications for each loudspeaker, and details how to change the configuration of the loudspeakers from passive to bi-amp or bi-amped dual mid-range mode (3202® III speaker only). There are schematic diagrams of each loudspeaker and recommended amplifier power is provided.

**Active Equalization** — Each Panaray® LT Series loudspeaker must have active equalization. This section contains information for providing active equalization.

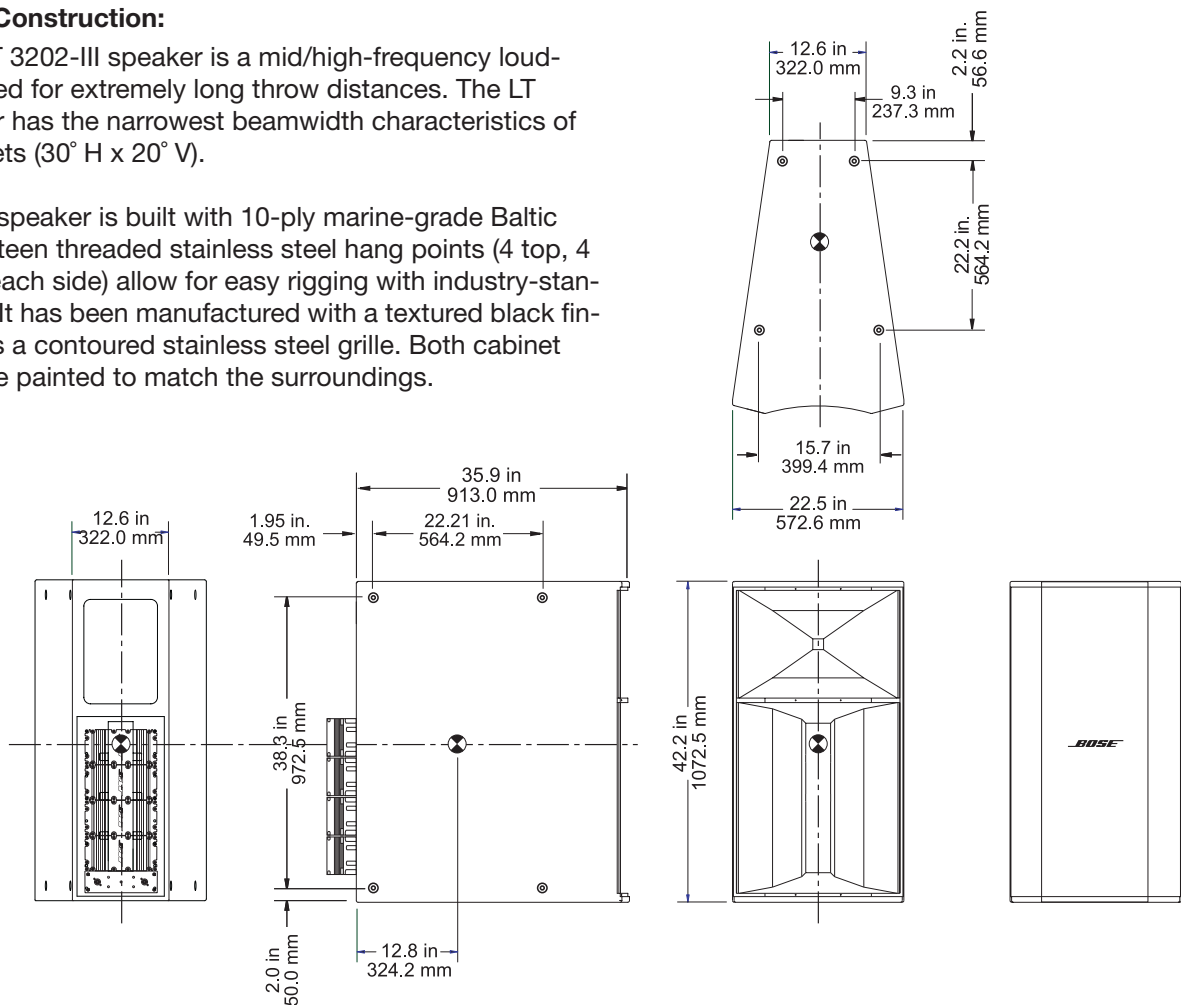
**Service Information** — This section provides ordering information for replacement transducers and diaphragm kits. Instructions on replacing the transducers and replacing the diaphragm are given. Exploded view assembly drawings are given for each loudspeaker. Information on painting the cabinets is provided.

## LT 3202<sup>®</sup>-III Loudspeaker

### Materials and Construction:

The Panaray<sup>®</sup> LT 3202-III speaker is a mid/high-frequency loudspeaker designed for extremely long throw distances. The LT 3202-III speaker has the narrowest beamwidth characteristics of all the LT cabinets (30° H x 20° V).

The LT 3202-III speaker is built with 10-ply marine-grade Baltic birch wood. Sixteen threaded stainless steel hang points (4 top, 4 bottom, and 4 each side) allow for easy rigging with industry-standard hardware. It has been manufactured with a textured black finish and includes a contoured stainless steel grille. Both cabinet and grille can be painted to match the surroundings.



### Dimensions:

35.9"D x 22.5"W x 42.2"H  
(913 mm x 573 mm x 1072 mm)

### Weight:

Unpacked: 194 lb (88 kg)  
Packaged: 241 lb (109 kg)

### Load Limits:

The LT 3202-III loudspeaker has a working load limit (WLL) of 395 lb (179 kg).

### Hardware:

- Use only graded hardware.
- Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum.
- Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties.
- Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

### Safety and Regulatory Compliance:

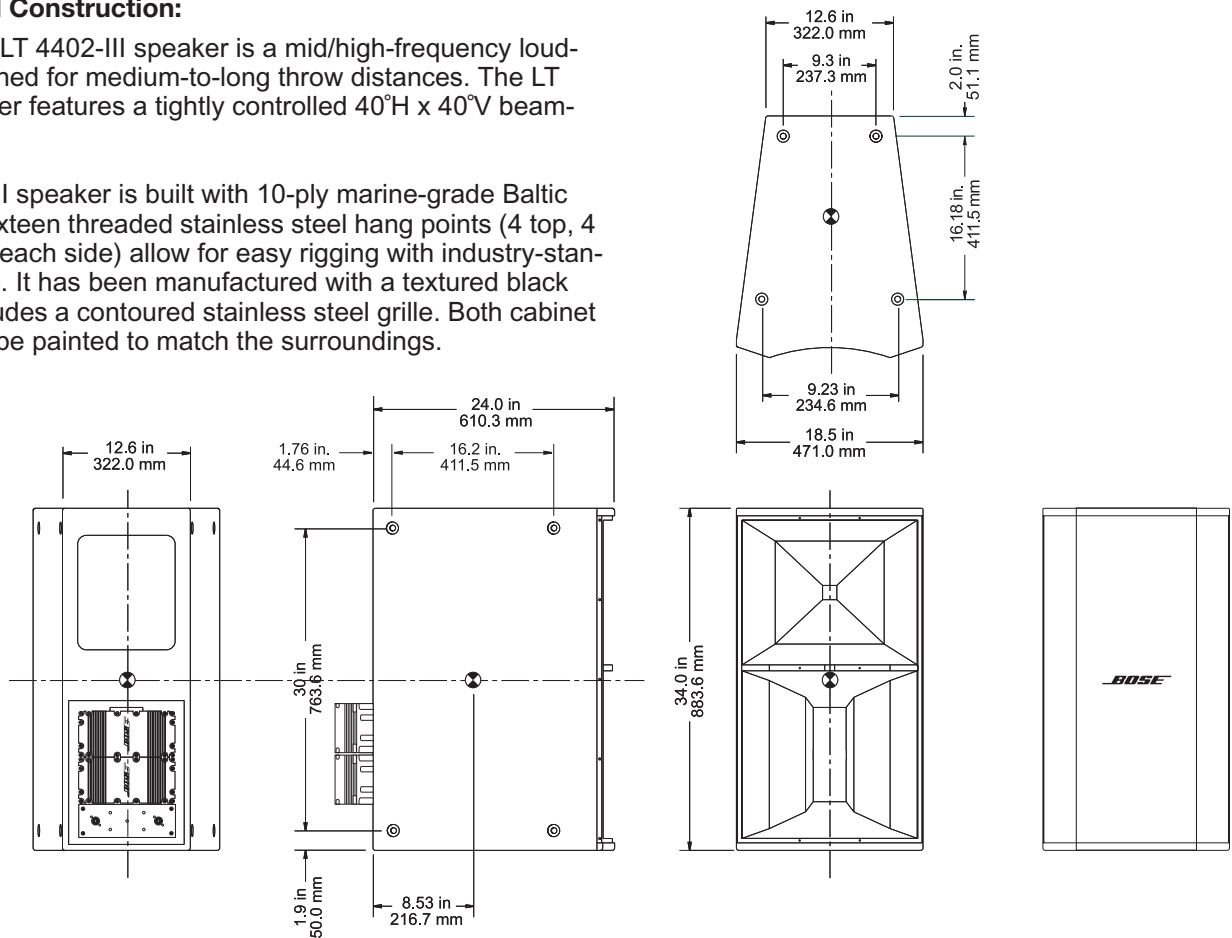
This loudspeaker complies with ANSI/EIA-636 "Recommended Loudspeaker Safety Practices" and with EU EMC Directives 89/336/EEC for CE marking.

## LT 4402<sup>®</sup> -III Loudspeaker

### Materials and Construction:

The Panaray<sup>®</sup> LT 4402-III speaker is a mid/high-frequency loudspeaker designed for medium-to-long throw distances. The LT 4402-III speaker features a tightly controlled 40°H x 40°V beam-width.

The LT 4402-III speaker is built with 10-ply marine-grade Baltic birch wood. Sixteen threaded stainless steel hang points (4 top, 4 bottom, and 4 each side) allow for easy rigging with industry-standard hardware. It has been manufactured with a textured black finish and includes a contoured stainless steel grille. Both cabinet and grille can be painted to match the surroundings.



### Dimensions:

24"H x 18.5"W x 34"W  
(610 mm x 471 mm x 884 mm)

### Weight:

Unpacked: 111 lb (50 kg)  
Packaged: 142 lb (64 kg)

### Load Limits:

The LT 4402-III loudspeaker has a working load limit (WLL) of 299 lb (135 kg).

### Hardware:

- Use only graded hardware.
- Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum.
- Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties.
- Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

### Safety and Regulatory Compliance:

This loudspeaker complies with ANSI/EIA-636 "Recommended Loudspeaker Safety Practices" and with EU EMC Directives 89/336/EEC for CE marking.

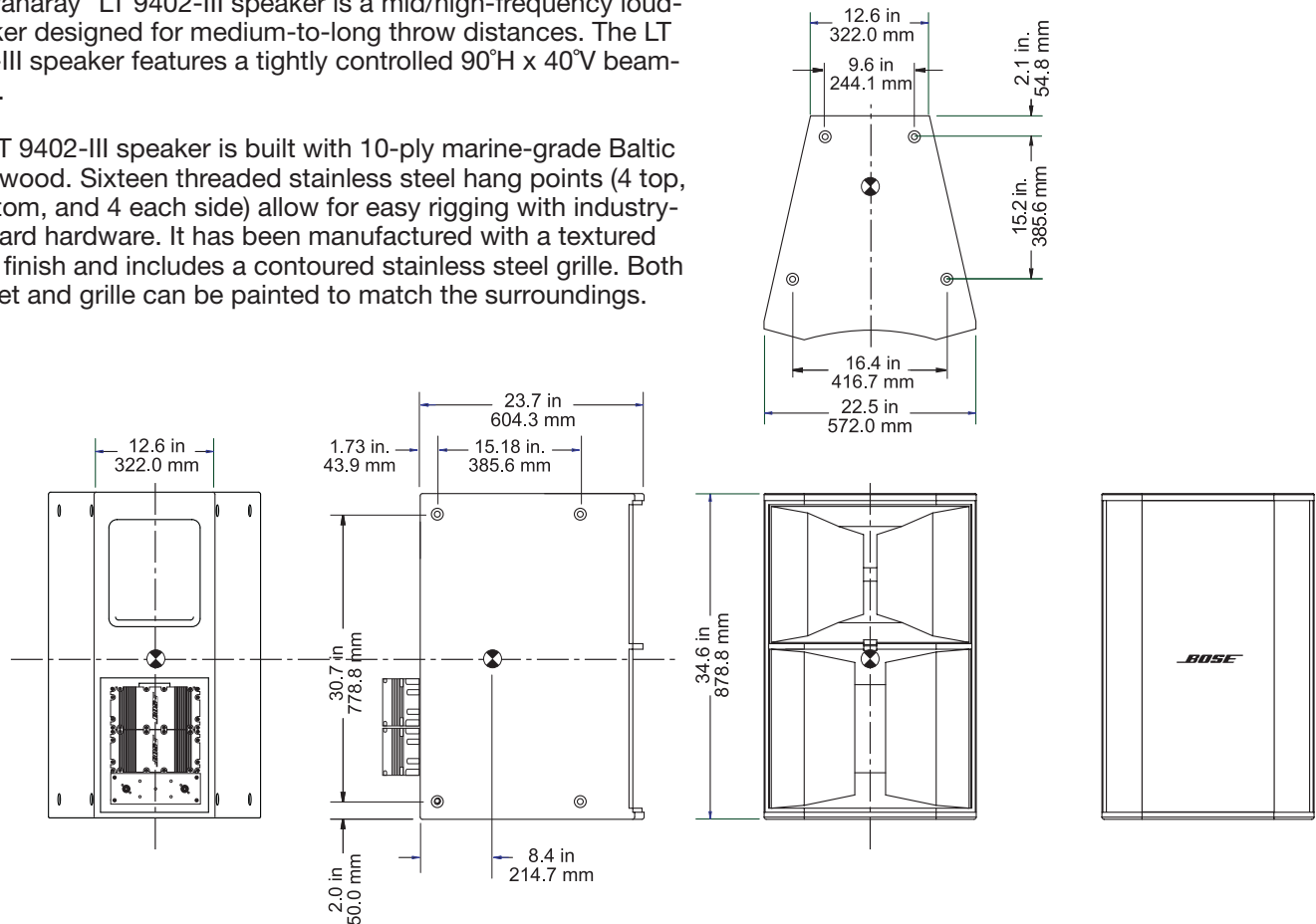


## LT 9402™-III Loudspeaker

### Materials and Construction:

The Panaray® LT 9402-III speaker is a mid/high-frequency loudspeaker designed for medium-to-long throw distances. The LT 9402-III speaker features a tightly controlled 90°H x 40°V beam-width.

The LT 9402-III speaker is built with 10-ply marine-grade Baltic birch wood. Sixteen threaded stainless steel hang points (4 top, 4 bottom, and 4 each side) allow for easy rigging with industry-standard hardware. It has been manufactured with a textured black finish and includes a contoured stainless steel grille. Both cabinet and grille can be painted to match the surroundings.



### Dimensions:

23.7"D x 22.5"W x 34.6"H  
(604 mm x 572 mm x 879 mm)

### Weight:

Unpacked: 113 lb (51 kg)  
Packaged: 146 lb (66 kg)

### Load Limits:

The LT 9402-III loudspeaker has a working load limit (WLL) of 261 lb (118 kg).

### Hardware:

- Use only graded hardware.
- Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum.
- Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties.
- Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

### Safety and Regulatory Compliance:

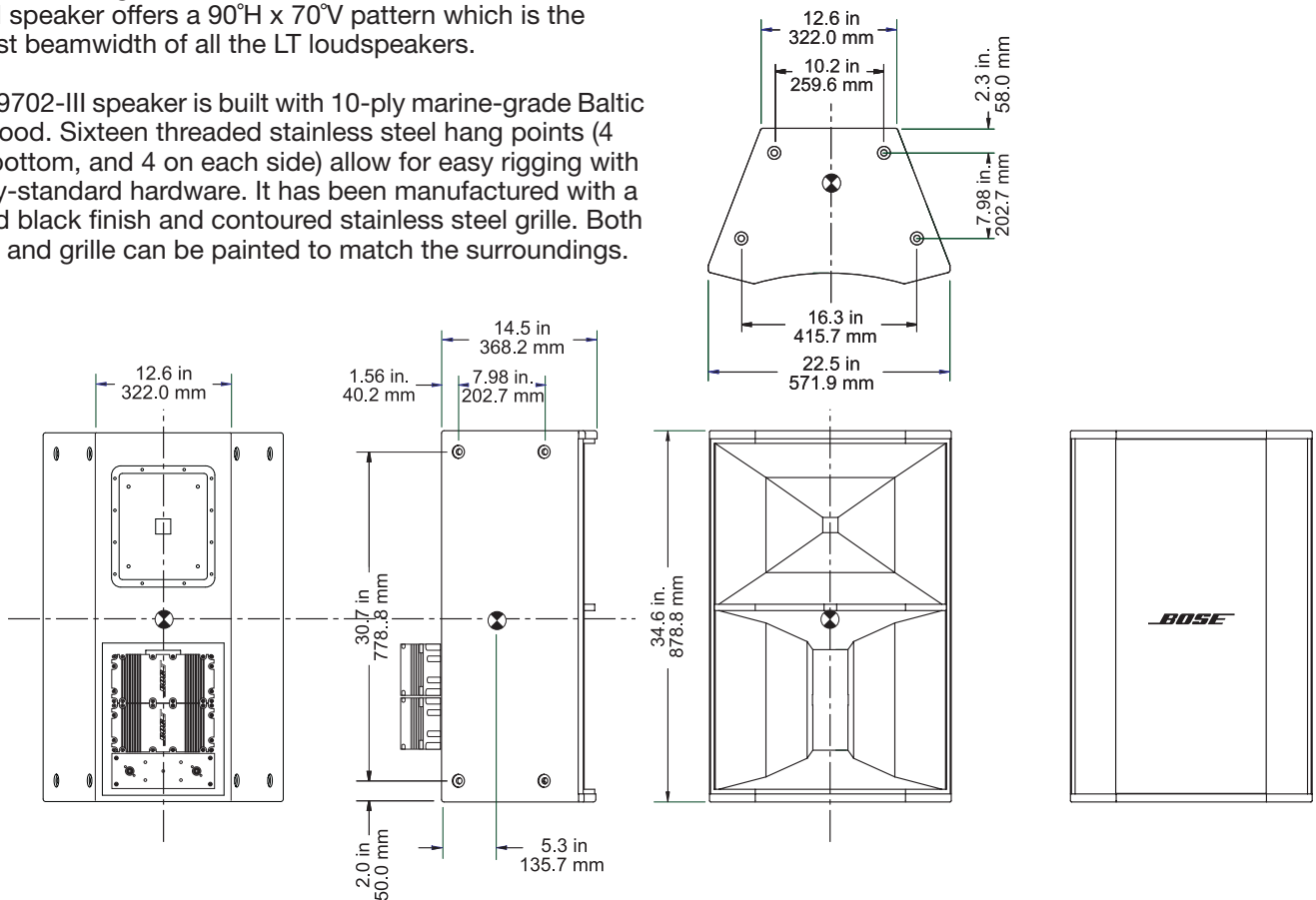
This loudspeaker complies with ANSI/EIA-636 "Recommended Loudspeaker Safety Practices" and with EU EMC Directives 89/336/EEC for CE marking.

## LT 9702<sup>®</sup>-III Loudspeaker

### Materials and Construction:

The Panaray<sup>®</sup> LT 9702-III speaker is a mid/high-frequency loudspeaker designed for shorter throw distances. The LT 9702-III speaker offers a 90°H x 70°V pattern which is the broadest beamwidth of all the LT loudspeakers.

The LT 9702-III speaker is built with 10-ply marine-grade Baltic birch wood. Sixteen threaded stainless steel hang points (4 top, 4 bottom, and 4 on each side) allow for easy rigging with industry-standard hardware. It has been manufactured with a textured black finish and contoured stainless steel grille. Both cabinet and grille can be painted to match the surroundings.



### Dimensions:

14.5"D x 22.5"W x 34.6"H  
(368 mm x 572 mm x 879 mm)

### Weight:

Unpacked: 96 lb (43 kg)  
Packaged: 124 lb (56 kg)

### Load Limits:

The LT 9702-III loudspeaker has a working load limit (WLL) of 381 lb (173 kg).

### Hardware:

- Use only graded hardware.
- Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum.
- Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties.
- Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

### Safety and Regulatory Compliance:

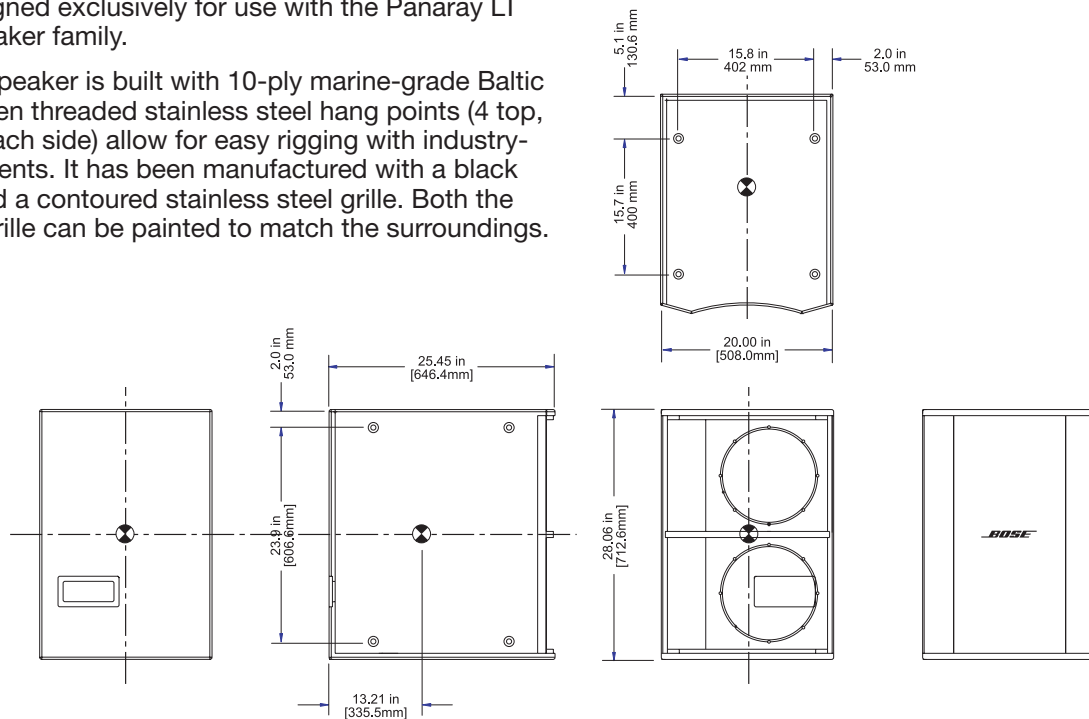
This loudspeaker complies with ANSI/EIA-636 "Recommended Loudspeaker Safety Practices" and with EU EMC Directives 89/336/EEC for CE marking.

## LT MB24-III Modular Bass Loudspeaker

### Materials and Construction:

The Panaray® LT MB24-III speaker is a compact, low-frequency loudspeaker designed exclusively for use with the Panaray LT mid/high loudspeaker family.

The LT MB24-III speaker is built with 10-ply marine-grade Baltic birch wood. Sixteen threaded stainless steel hang points (4 top, 4 bottom and 4 each side) allow for easy rigging with industry-standard components. It has been manufactured with a black textured finish and a contoured stainless steel grille. Both the cabinet and the grille can be painted to match the surroundings.



### Dimensions:

25.5"D x 20"W x 28.1"H  
646 mm x 508 mm x 712 mm)

### Weight:

Unpacked: 130 lb (59.19 kg)  
Packaged: 147 lb (66.9 kg)

### Load Limits:

The LT MB24 modular bass loudspeaker has a working load limit (WLL) of 520 lb (236 kg).

### Hardware:

- Use only graded hardware.
- Fasteners should be SAE Grade 5 or ASTM designation A354, Grade BC minimum.
- Unmarked machine fasteners should not be used for mounting system assembly, as there is no way to determine their physical properties.
- Do not use an M10 fastener; although it is very similar to an SAE  $\frac{3}{8}$ -16, they are not interchangeable. M10 washers may be used in place of  $\frac{3}{8}$ -inch washers.

### Safety and Regulatory Compliance:

This loudspeaker complies with ANSI/EIA-636 "Recommended Loudspeaker Safety Practices" and with EU EMC Directives 89/336/EEC for CE marking.

### Recommended Wire Gauges

The loudspeakers should be connected to the amplifier outputs with heavy-gauge wire. To minimize power loss, larger diameter wire should be used for longer lengths. The following chart can be used as a guide.

Length of Wire	Wire Gauge
25 feet	16
40 feet	14
60 feet	12
100 feet	10
150 feet	8

**Note:** All wiring shall conform to applicable local and/or national electrical codes.

Verify that the polarity of the amplifier outputs are connected properly to the loudspeaker.

### Internal Configurations

All Panaray® loudspeakers ship with a selectable internal crossover.

Each speaker ships in the passive position, but you can change the configuration from passive to bi-amped or bi-amped dual mid-range (LT 3202®-III only).

- In passive mode — the internal passive crossover network is utilized, and a single amplified signal is connected to the loudspeaker. This requires only one set of input connections and one amplifier channel.
- In bi-amplified mode — the mid-frequency and high-frequency drivers are accessed through separate pins on the NL8 connector. Two sets of connections and two amplifier channels are required. Bi-amplified mode allows additional control of the balance between the mid-frequency and high-frequency levels.
- In bi-amplified dual mid-range mode — the mid-frequency and high-frequency drivers are accessed through separate pins on the NL8 connectors. Three sets of connections and three amplifier channels are required. Bi-amplified dual mid-range allows independent control of two sets of V2 mid-frequency drivers as well as control of the high-frequency driver.

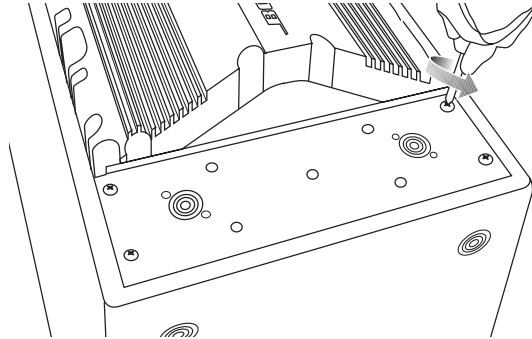
**Note:** There are no passive components in line when bi-amp or bi-amp dual mid-range configurations are selected.

All Panaray LT loudspeakers require active equalization. Do not operate the loudspeakers without the proper active equalization for the particular loudspeaker and operating configuration. Failure to do so may result in permanent damage to the loudspeaker.

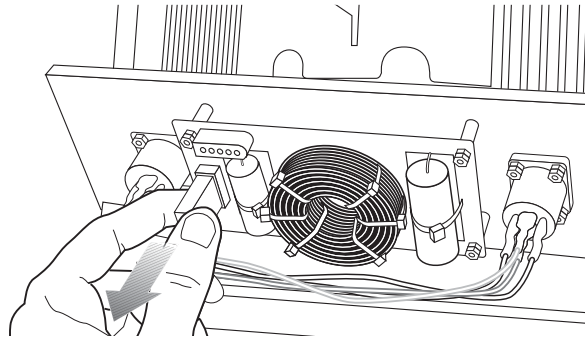
See the Active Equalization section for more details.

**To configure your LT 9702<sup>®</sup>-III, LT 9402<sup>™</sup>-III, or LT 4402<sup>®</sup>-III loudspeaker:**

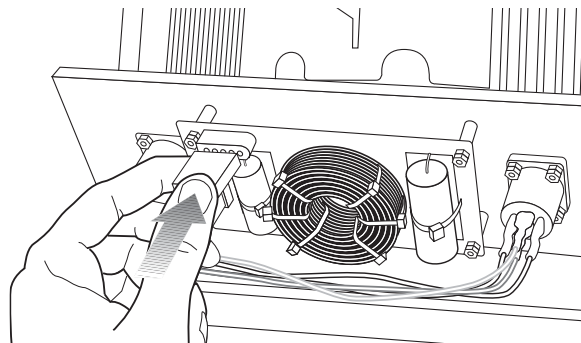
1. Turn off amplifier power and disconnect the loudspeaker input connection. Remove the rear connector plate.



2. Remove connector from the passive position.

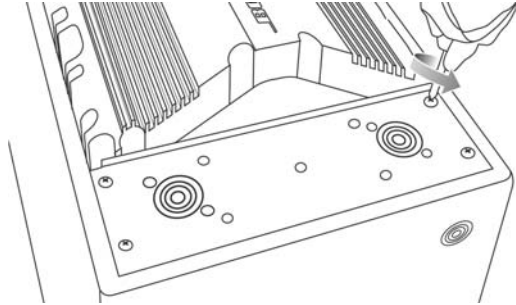


3. Insert in the bi-amped position.

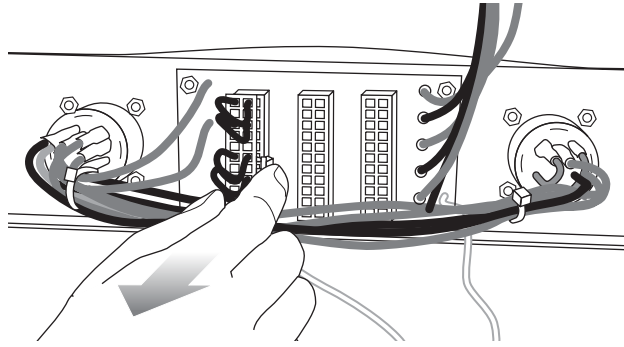


### To reconfigure your LT 3202<sup>®</sup>-III loudspeaker (only):

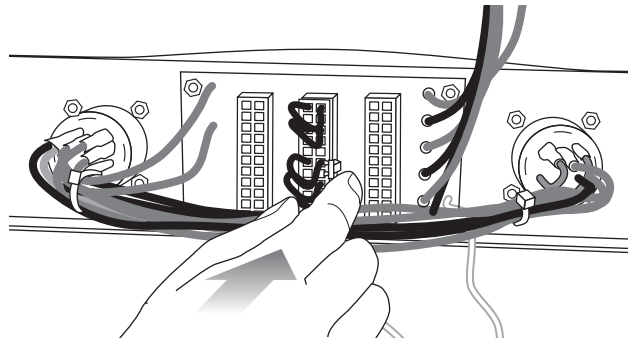
1. Turn off amplifier power and disconnect the loudspeaker input connection. Remove the rear panel.



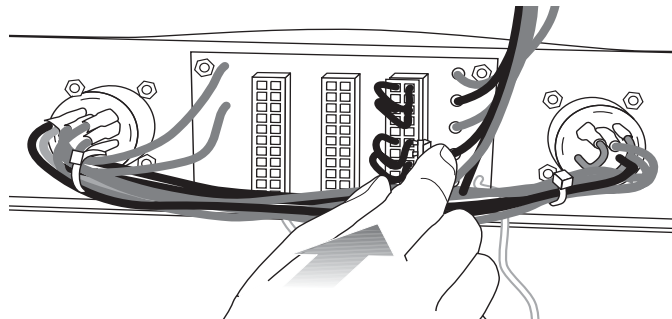
2. Pull out the connector from the passive position.



3. Insert in the bi-amped position.

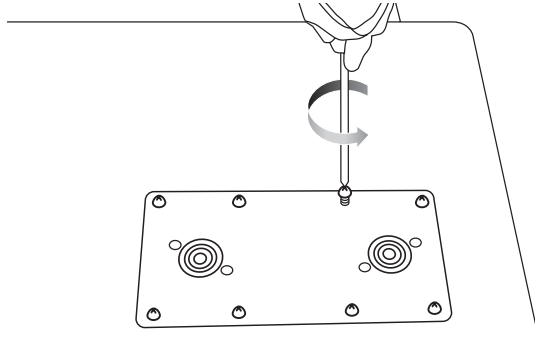


4. Or insert in the bi-amped dual mid-range position.

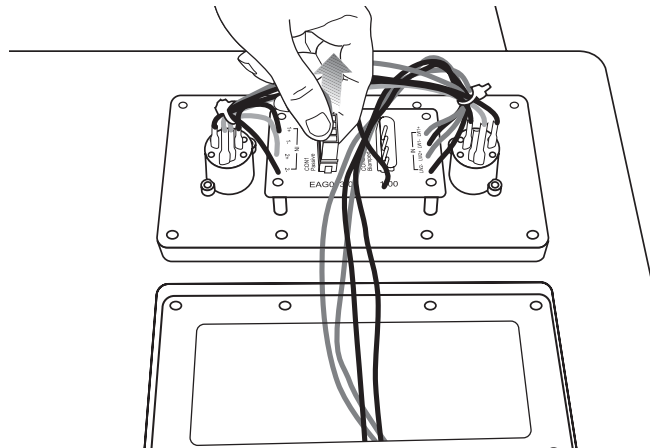


**To reconfigure your LT MB24-III modular bass loudspeaker:**

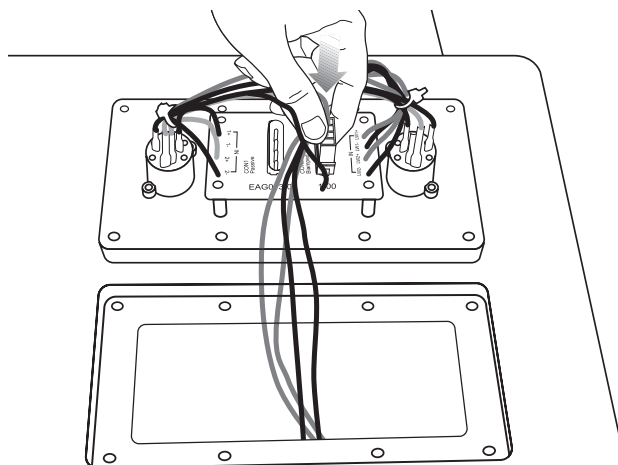
1. Turn off amplifier power and disconnect the loudspeaker input connection. Remove the rear panel.



2. Pull out the connector from the passive position.



3. Insert in the bi-amped position.



## LT 3202®-III Loudspeaker Product Description



LT 3202-III speaker with grille



LT 3202-III speaker without grille



LT 3202-III speaker rear

The Bose® Panaray® LT 3202®-III loudspeaker is a mid/high-frequency loudspeaker designed for long throw distances. The LT 3202-III loudspeaker has the narrowest coverage characteristics of all the LT cabinets.

When arrayed correctly, LT 3202-III loudspeakers behave sonically as a large single source of sound energy. This coherent wavefront provides full fidelity and even-coverage, at critical mid- and high-frequencies throughout the coverage area of the array.

Each Panaray LT 3202-III loudspeaker uses four V2 mid-frequency drivers and a 1.4" compression driver mounted on a 30°H x 20°V constant directivity waveguide.

The LT 3202-III loudspeaker can be operated in passive, bi-amplified, or bi-amplified dual mid-range modes.

- In passive mode, the internal crossover network is utilized, and a single amplified signal is connected to the loudspeaker.
- In bi-amplified mode, the mid-frequency and high-frequency drivers are accessed through separate pins on the Neutrik NL8 connectors.
- Bi-amplified dual mid-range mode allows independent control of two pairs of V2 mid-frequency drivers as well as control of the high-frequency driver. The mid-frequency and high-frequency drivers are accessed through separate pins on the Neutrik NL8 connectors.

Active equalization of the LT 3202-III loudspeaker can be provided by using the Panaray LT 3202-III EQ card or the Panaray speaker and combination of speakers. A parametric equalizer can replicate the active equalization curve on the following page, along with a high-pass filter and low pass filter as shown.

### LT 3202-III Acoustical Specifications

	Passive	Bi-Amped		Bi-amped Dual Mid-range		
		Mid	High	Mid 1	Mid 2	High
Power Handling <sup>1</sup>	280W	280W	75W	140W	140W	75W
Impedance	16 Ω	16 Ω	8 Ω	8 Ω	8 Ω	8 Ω
Sensitivity <sup>2</sup> : (at 1W @ 1m)	110 dB SPL	107 dB SPL	111 dB SPL	104 dB SPL	104 dB SPL	111 dB SPL
Maximum SPL <sup>3</sup> : (pink noise @1m @ rated power)	135 dB SPL	132 dB SPL	130 dB SPL	129 dB SPL	129 dB SPL	130 dB SPL
Recommended Crossover	Internal Crossover @ 1.6 kHz	<b>Mid Frequency:</b> HPF: 160 Hz, Butterworth, 4th order LPF: 1600 Hz, Butterworth, 4th order		<b>High Frequency:</b> HPF: Butterworth, 4th order LPF: Butterworth, 4th order		
Frequency Range <sup>4</sup> (± 3 dB)	200 Hz - 16 kHz					
Beamwidth (-6dB point, average 800 - 5 kHz)	Horizontal: 36°, Vertical: 22°					

### How our loudspeakers are measured

#### 1. Power Handling

Full bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 3. Maximum SPL

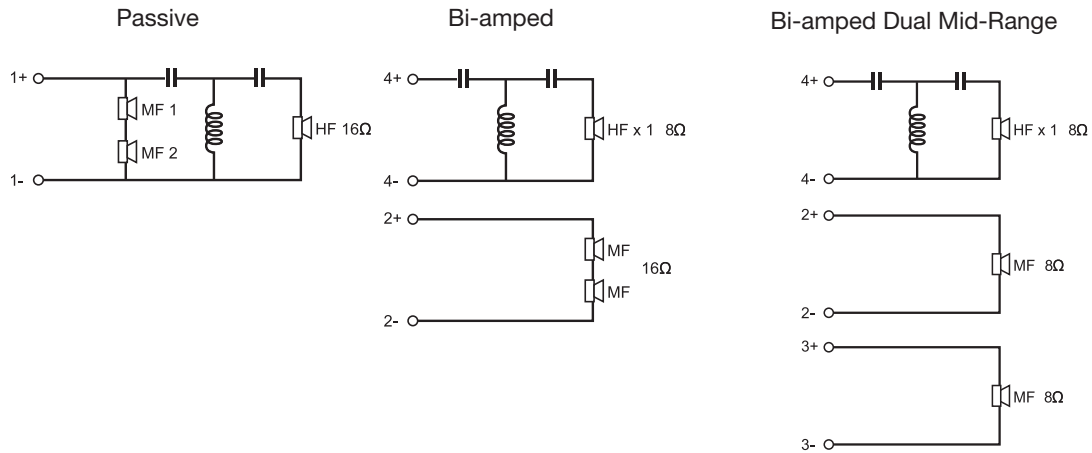
Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 4. Frequency Range

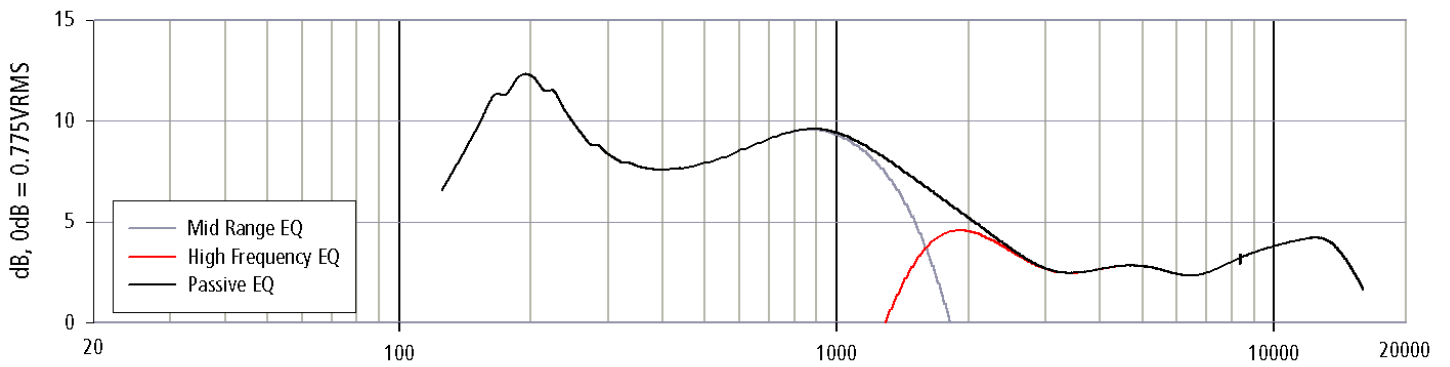
Sine waves are injected into the loudspeaker and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1meter. Resulting graph is smoothed by 0.05 octave-band.



LT 3202®-III Loudspeaker Configurations



LT 3202-III Loudspeaker Active Equalization Curves



## LT 4402® -III Loudspeaker Product Description



LT 4402-III speaker with grille

The Bose® Panaray® LT 4402®-III loudspeaker is a mid/high-frequency device designed for medium to long throw distances. The LT 4402-III loudspeaker offers a 44° horizontal by 38° vertical dispersion pattern which is ideal for highly reverberant spaces.

When arrayed correctly, LT 4402-III loudspeakers behave sonically as a large, single source of sound energy. This coherent wavefront provides full fidelity and even-coverage at critical mid- and high-frequencies throughout the coverage area of the array.

Each Panaray LT 4402-III loudspeaker uses two V2 mid-frequency drivers and a 1.4" compression driver mounted on a 40°H x 40°V constant directivity waveguide.

The LT 4402-III loudspeaker can be operated in passive or bi-amplified modes.

- In passive mode, the internal passive crossover network is utilized, and a single amplified signal is connected to the loudspeaker.
- In bi-amplified mode, the mid-frequency and high-frequency drivers are accessed through separate pins on the Neutrik NL4 connectors.

Active equalization of the LT 4402-III loudspeaker can be provided by using the Panaray LT 4402-III EQ card or the Panaray System controller with presets for each Panaray speaker and combination of speakers. A parametric equalizer can replicate the active equalization curve on the following page, along with a high-pass filter and low pass filter as shown.



LT 4402-III speaker without grille

## LT 4402-III Acoustical Specifications

	Passive	Bi-Amped	
		Mid	High
Power Handling <sup>1</sup>	140W	140W	75W
Impedance	8 Ω	8 Ω	8 Ω
Sensitivity: (at 1W @ 1m)	108 dB SPL	106 dB SPL	107 dB SPL
Maximum SPL <sup>3</sup> (pink noise @1m @ rated power)	130 dB SPL	128 dB SPL	126 dB SPL
Recommended Crossover	Internal Crossover @ 1.6 kHz	<b>Mid Frequency</b> HPF: 160 Hz, Butterworth, 4th order LPF: 1600 Hz, Butterworth, 4th order <b>High Frequency</b> HPF: 1600 Hz, Butterworth, 4th order LPF: 20 kHz, Butterworth, 4th order	
Frequency Range <sup>4</sup> (± 3 dB)	180 Hz - 16 kHz		
Beamwidth (-6dB point, average 800 - 5 kHz)	Horizontal: 44°, Vertical: 38°		

### How our loudspeakers are measured

#### 1. Power Handling

Full bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 3. Maximum SPL

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

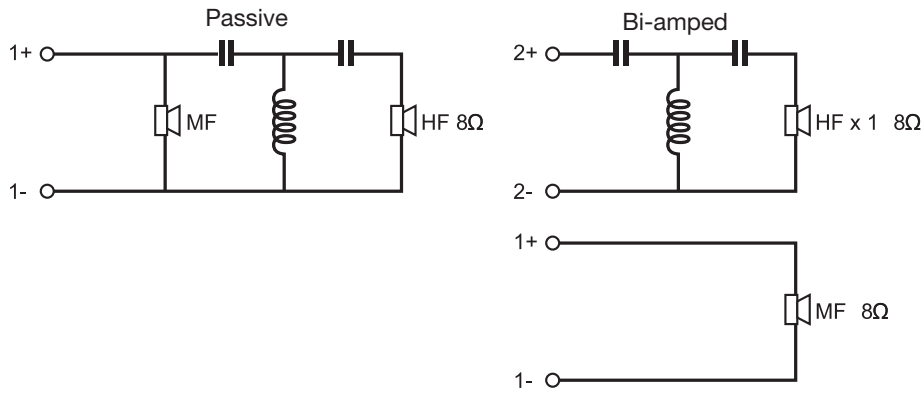
#### 4. Frequency Range

Sine waves are injected into the loudspeaker and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1 meter. Resulting graph is smoothed by 0.05 octave-band.

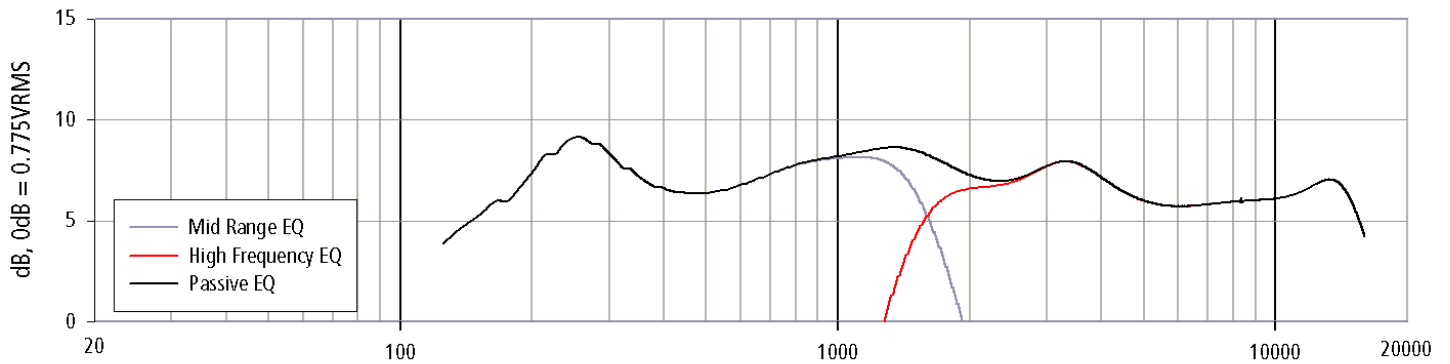


LT 4402-III speaker rear

**LT 4402<sup>®</sup> -III Loudspeaker Configurations**



**LT 4402-III Loudspeaker Active Equalization Curves**



## LT 9402™-III Loudspeaker Product Description



LT9402-III speaker with grille



LT9402-III speaker without grille



LT9402-III speaker rear

The Bose® Panaray® LT 9402™-III loudspeaker is a mid/high-frequency device designed for medium throw distances. The LT 9402-III loudspeaker offers an 95° horizontal by 39° vertical dispersion pattern that allows you to cover a large seating area and direct energy away from reflective surfaces such as ceilings.

When arrayed correctly, LT 9402-III loudspeakers behave sonically as a large single source of sound energy. This Coherent Wavefront provides full fidelity and even-coverage at critical mid- and high-frequencies throughout the coverage area of the array.

Each PANARAY LT 9402-III loudspeaker uses two V2 mid-frequency drivers and a 1.4" compression driver mounted on a 90°H x 40°V constant directivity waveguide.

The LT 9402-III loudspeaker can be operated in passive or bi-amplified modes.

- In passive mode, the internal passive crossover network is utilized and a single amplified signal is connected to the loudspeaker.
- In bi-amplified mode, the mid-frequency and high-frequency drivers are accessed through separate pins on the Neutrik NL4 connectors.

Active equalization for the LT 9402 III loudspeaker can be provided by using the Panaray LT 9402-III EQ card or the Panaray System controller with presets for each Panaray speaker and combination of speakers. A parametric equalizer can replicate the active equalization curve on the following page, along with a high-pass filter and low pass filter as shown.

### LT 9402-III Acoustical Specifications

	Passive	Bi-Amped	
		Mid	High
Power Handling <sup>1</sup>	140W	140W	75W
Impedance	8 Ω	8 Ω	8 Ω
Sensitivity <sup>2</sup> (at 1W @ 1m)	106 dB SPL	106 dB SPL	106 dB SPL
Maximum SPL <sup>3</sup> (pink noise @1m @ rated power)	128 dB SPL	128 dB SPL	125 dB SPL
Recommended Crossover	Internal Crossover @ 1.6 kHz	<b>Mid Frequency</b> HPF: 160 Hz, Butterworth, 4th order LPF: 1600 Hz, Butterworth, 4th order <b>High Frequency</b> HPF: 1600 Hz, Butterworth, 4th order LPF: 20 kHz, Butterworth, 4th order	
Frequency Range <sup>4</sup> (± 3 dB)	180 Hz - 16 kHz		
Beamwidth (-6dB point, average 800 - 5 kHz)	Horizontal: 95°, Vertical: 39°		

### How our loudspeakers are measured

#### 1. Power Handling

Full bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

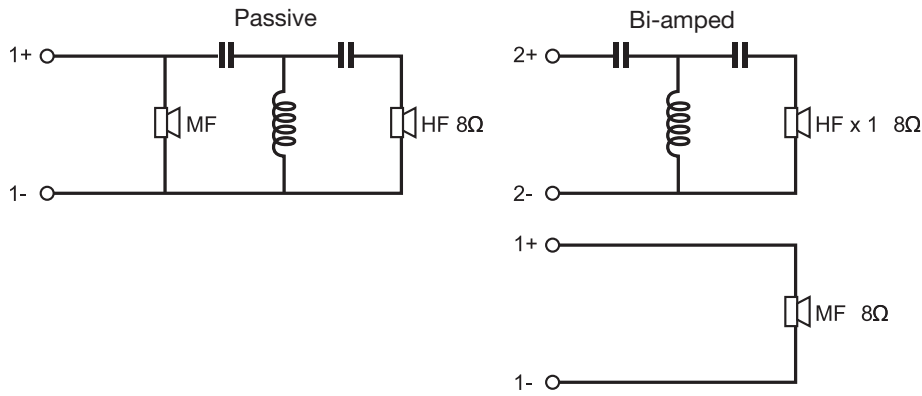
#### 3. Maximum SPL

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

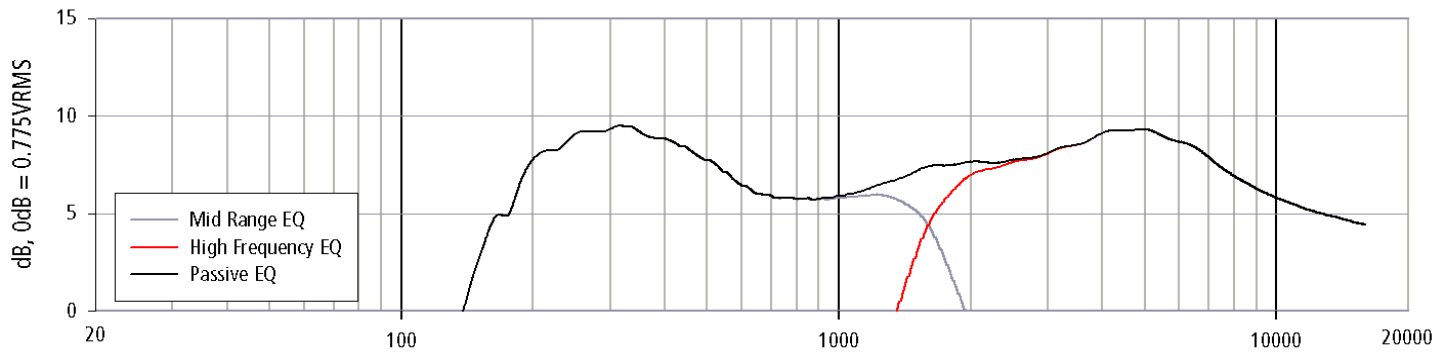
#### 4. Frequency Range

Sine waves are injected into the loudspeaker and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1meter. Resulting graph is smoothed by 0.05 octave-band.

**LT 9402™-III Loudspeaker Configurations**



**LT 9402-III Loudspeaker Active Equalization Curves**



## LT 9702®-III Loudspeaker Product Description



LT 9702-III speaker with grille



LT 9702-III speaker without grille



LT 9702-III speaker rear

The Bose® Panaray® LT 9702®-III loudspeaker is a mid/high-frequency device designed for shorter throw distances. The LT 9702-III loudspeaker offers an 92° horizontal by 61° vertical dispersion pattern which is the broadest beamwidth of all the LT loudspeakers.

When arrayed correctly, LT 9702-III loudspeakers behave sonically as a large single source of sound energy. This Coherent Wavefront provides full fidelity and even coverage at critical mid- and high-frequencies throughout the coverage area of the array.

Each Panaray LT 9702-III loudspeaker uses two V2 mid-frequency drivers combined with a 1.4" compression driver mounted on a 90°H x 70°V constant directivity waveguide.

The LT 9702-III loudspeaker can be operated in a passive or bi-amplified mode.

- In passive mode, the internal passive crossover network is utilized and a single amplified signal is connected to the loudspeaker.
- In bi-amplified mode, the mid-frequency and high-frequency drivers are accessed through separate pins on the Neutrik NL4 connectors.

Active equalization for the LT 9702 III loudspeaker can be provided by using the Panaray LT 9702-III EQ card or the Panaray system digital controller with presets for each Panaray speaker and combination of speakers. A parametric equalizer can replicate the active equalization curve on the following page, along with a high-pass filter and low pass filter as shown.

### LT 9702-III Acoustical Specifications

	Passive	Mid	Bi-Amped	High
Power Handling <sup>1</sup>	140W	140W		75W
Impedance	8 Ω	8 Ω		8 Ω
Sensitivity <sup>2</sup> (at 1W @ 1m)	104 dB SPL	105 dB SPL		104 dB SPL
Maximum SPL <sup>3</sup> (pink noise @1m @ rated power)	126 dB SPL	127 dB SPL		123 dB SPL
Recommended Crossover	Internal Crossover @ 1.6 kHz	<b>Mid Frequency</b> HPF: 160 Hz, Butterworth, 4th order LPF: 1600 Hz, Butterworth, 4th order <b>High Frequency</b> HPF: 1600 Hz, Butterworth, 4th order LPF: 20 kHz, Butterworth, 4th order		
Frequency Range <sup>4</sup> (± 3 dB)	180 Hz - 16 kHz			
Beamwidth (-6dB point, average 800 - 5 kHz)	Horizontal: 92°, Vertical: 61°			

### How our loudspeakers are measured

#### 1. Power Handling

Full bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

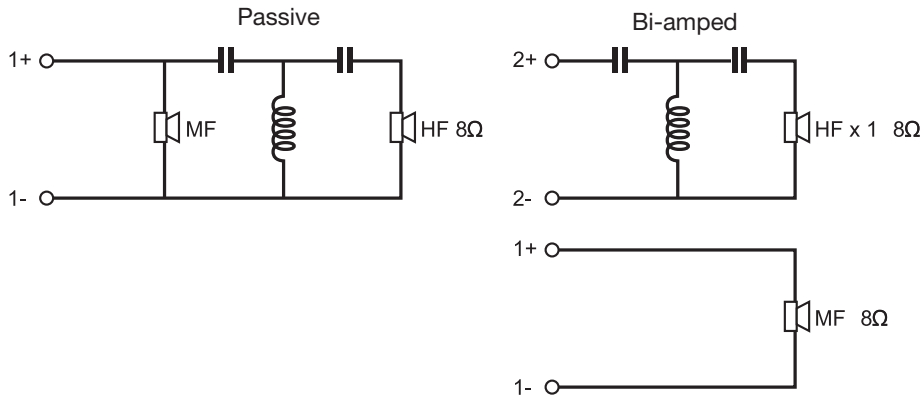
#### 3. Maximum SPL

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

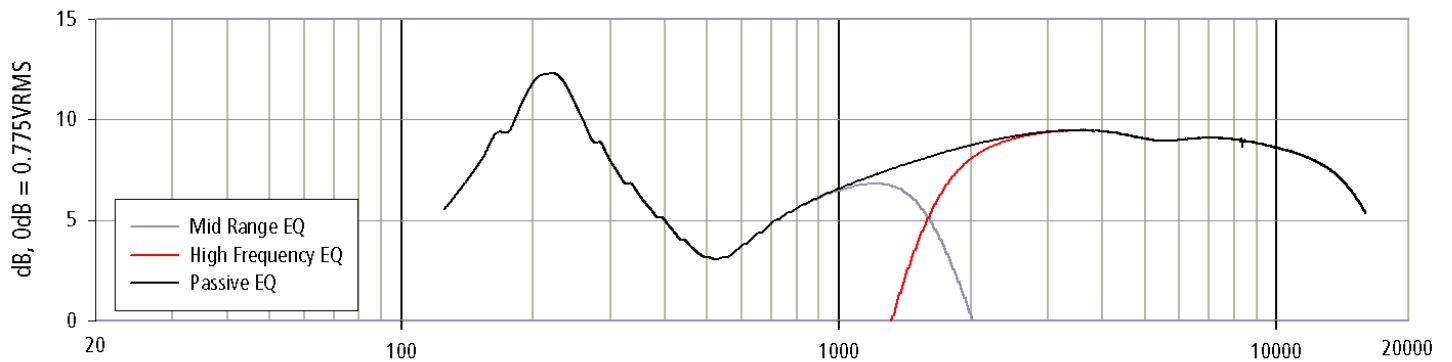
#### 4. Frequency Range

Sine waves are injected into the loudspeaker and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1meter. Resulting graph is smoothed by 0.05 octave-band.

**LT 9702<sup>®</sup>-III Loudspeaker Configurations**



**LT 9702-III Loudspeaker Active Equalization Curves**



## LT MB24 Loudspeaker Product Description



LT MB24-III with grille



LT MB24-III without grille



LT MB24-III rear

The Panaray® LT MB24-III modular bass loudspeaker is a compact low-frequency loudspeaker designed exclusively for use with the Panaray LT mid/high-frequency loudspeaker family.

The LT MB24-III integrates two 12" woofers in a proprietary acoustic enclosure. This enables the LT MB24-III to deliver high SPL and wide bandwidth without audible port noise. The size of the LT MB24-III has also been optimized so that it can be used in multiple bass array configurations.

The LT MB24-III is fully compatible – acoustically and aesthetically – with LT mid/high-frequency loudspeakers. The LT MB24-III loudspeaker is the ideal bass extension solution for any of the LT mid/high-frequency loudspeakers.

Each Panaray LT MB24-III bass loudspeaker uses two 12" low-frequency drivers built into a proprietary acoustic enclosure.

The LT MB24-III can be operated in parallel or discrete modes.

- In parallel mode, a single amplified signal is connected to the loudspeaker.
- In discrete mode, each loudspeaker can be independently driven by a separate amplifier. Individual drivers are accessed through separate pins on the Neutrik NL4 connectors.

Active Equalization for the LT MB24-III loudspeaker can be provided by using the Panaray LT MB24-III EQ card or the Panaray System Digital Controller with presets for each Panaray speaker and combination of speakers. A parametric equalizer can replicate the active equalization curve on the following page, along with a high-pass filter and low pass filter as shown.

### LT MB24-III Acoustical Specifications

	Parallel	Discrete	
		Driver 1	Driver 2
Power Handling <sup>1</sup>	800W	400W	400W
Impedance	4 Ω	8 Ω	8 Ω
Sensitivity <sup>2</sup> (at 1W @ 1m)	94 dB SPL	91 dB SPL	91 dB SPL
Maximum SPL <sup>3</sup> (pink noise @1m @ rated power)	123 dB SPL	117 dB SPL	117 dB SPL
Recommended Crossover	HPF: 40Hz, Butterworth, 4th order LPF: 250Hz, Butterworth, 4th order		
Frequency Range <sup>4</sup> (± 3 dB)	40 Hz - 250 Hz		

### How our loudspeakers are measured

#### 1. Power Handling

Full bandwidth pink noise, meeting the IEC Standard #268-5, is applied to the loudspeaker and amplified to a level at the loudspeaker terminals corresponding to the power handling of the loudspeaker. The loudspeaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

#### 2. Sensitivity

Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to 1 watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 3. Maximum SPL

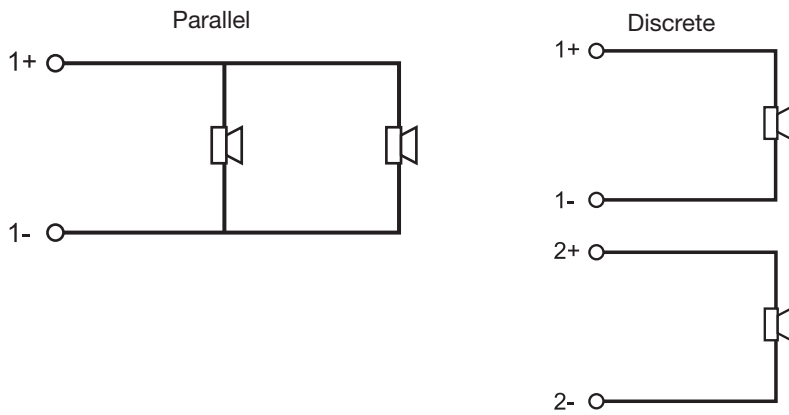
Full bandwidth pink noise is applied to the loudspeaker with its active equalization curve and amplified to a level at the loudspeaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

#### 4. Frequency Range

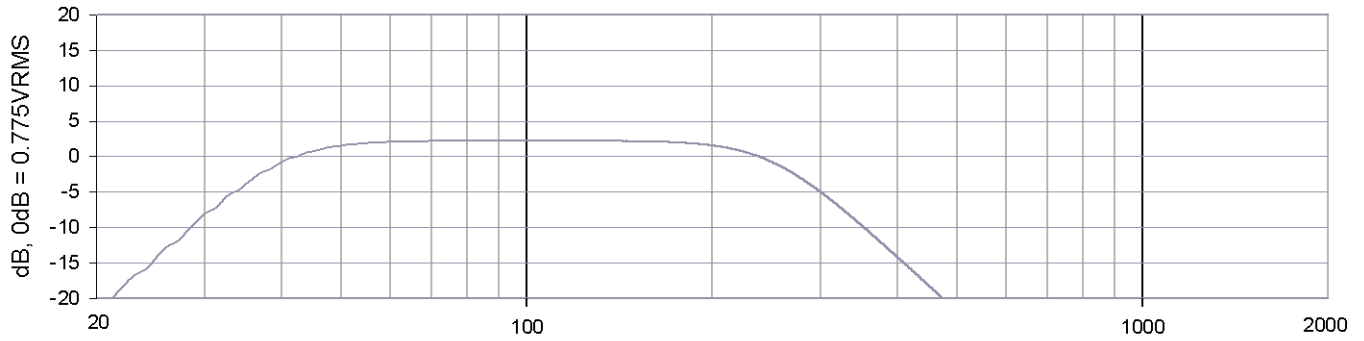
Sine waves are injected into the loudspeaker and the level is adjusted to 1 watt, as referenced to the nominal impedance, and the level measured at 1 meter. Resulting graph is smoothed by 0.05 octave-band.



**LT MB24-III Loudspeaker Configurations**



**LT MB24-III Loudspeaker Active Equalization Curve**



## Active Equalization

**WARNING:** All Panaray<sup>®</sup> LT Series III loudspeakers require active equalization. Do not operate the loudspeakers without the proper active equalization for the particular loudspeaker and operating configuration. Failure to do so may result in permanent damage to the loudspeaker.

EQ Card Product Codes	
LT 3202 <sup>®</sup> -II/III Passive EQ Card	011502
LT 4402 <sup>®</sup> -II/III Passive EQ Card	011504
LT 9702 <sup>®</sup> -II/III Passive EQ Card	017929
LT 9402 <sup>™</sup> -III Passive EQ Card	035325
LT Series II MF EQ Card	018485
LT MB24-III/MB4 EQ Card	027058

### **Active equalization with the Bose<sup>®</sup> 1600-VI or 1800-VI amplifier**

When using the Bose 1600-VI or 1800-VI amplifier to power Panaray LT Series III loudspeakers, optional active equalization cards are available from Bose. These cards install inside the rear of the 1600-VI or 1800-VI amplifier. The equalized signal from one 1800-VI amplifier can be daisy-chained to other amplifiers that use the same audio signal as the first loudspeaker (same equalization, in the same configuration, with the same time delay, etc.). Usually only one EQ card is required for each loudspeaker type in a cluster.

### **Other methods of providing active equalization**

If you are using a non-Bose amplifier, the Panaray system digital controller can provide active equalization for the LT Series III loudspeakers. A parametric equalizer can also replicate the active equalization curve below along with a high-pass filter and low-pass filter. The active equalization curves are located in the Acoustical Specifications and Wiring section.

### **LT Series III Mid/High Loudspeakers**

When using the loudspeakers in the passive mode, there is a different EQ card required for each of the four loudspeakers. These equalization curves are designed for a single loudspeaker.

When several loudspeakers are used together in a cluster, coupling in the low mid-frequency often occurs which boosts these frequencies. There is a jumper on the EQ cards that compensates for this coupling phenomenon. Cutting jumper C20 decreases the low mid-frequency equalization (by 4dB at 200Hz).

In bi-amplified mode, one mid-frequency EQ card is available for use with any of the three Panaray LT Series III loudspeakers. This EQ card is used to provide an equalized signal for the mid-frequency (V2) driver only.

In bi-amplified dual mid range mode (LT 3202-III only), the mid frequency EQ card should be used for each pair of V2 drivers.

### **LT MB24 Modular Bass Loudspeaker:**

The LT MB24 requires the same active equalization for both parallel and discrete modes.

This section contains information on servicing Panaray® LT cabinets.

- Ordering information for replacement parts
- Painting information
- Replacement instructions for transducers or diaphragms
- Drawings of each cabinet type

 **Note:** Service should only be performed by a qualified audio professional.

### **Panaray LT Replacement Parts**

To order replacement parts, call the Bose® Customer Service center nearest you. Request parts by the part number in the left hand column above

Replacement part	Product	Part number
3202-III Grille (includes screws)	3202®-III	276843
4402-III Grille (includes screws)	4402®-III	276844
9402-III Grille (includes screws)	9402™-III	276845
9702-III Grille (includes screws)	9702®-III	276846
Replacement Screws for grille	All	276847
Replacement Logo	All	276848
Input panel w/crossover board 3202	3202-III	276851
Input panel w/crossover board 4402	4402-III	276852
Input panel w/crossover board 9402	9402-III	276853
Input panel w/crossover board 9702	9702-III	276854
Compression driver	All	276860
Diaphragm for compression driver	All	276861
Compression driver plate w/screws	All	276849
V2 assembly with drivers	All	276850
Grille w/screws, tape, logo, tape, fastener and spring	MB24-III	278244
Screws for grille	MB24-III	276847
Logo with tape, fastener and spring	MB24-III	276848
Input panel w/molex connector	MB24-III	278245
Woofers	MB24-III	278248

### **Painting Information**

The Panaray® LT 3202®-III, 4402®-III, 9402™-III, 9702®-III and MB24-III loudspeaker cabinets can be painted. When painting an LT loudspeaker, it is important that no paint is applied to the transducers or connector panel.

Before painting the cabinet, turn off the amplifier power and disconnect the loudspeaker input connection. Make sure the cabinet is clean and free of dust and debris. The transducers and connector panel must be removed or masked so that no paint can get on them. For maximum paint adhesion, an alkyd enamel (oil based) primer should be used. Follow the instructions of the primer manufacturer in applying the primer. When the primer is sufficiently dry, latex paint can be applied to the cabinet. Several layers of paint may be needed, depending on the color of the paint and the cosmetic standards desired. Paint can be applied in any standard method including brush, roller, spray, etc. The method of applying paint should be determined by the cosmetic standards desired. For best results, a professional spray paint process should be used.

The above paragraph contains the recommended painting method for maximum paint adhesion and cosmetic standards. If an alkyd enamel primer cannot be used, a latex primer can be used but this will not provide as much adhesion as the alkyd enamel primer. Latex paint can also be used directly on the cabinet without any primer but this will also result in less adhesion.

## To Replace the t1.4hp High-frequency Compression Driver in the Panaray® LT 3202® -III, LT 4402® -III, LT 9402™ -III or LT 9702® -III Loudspeakers

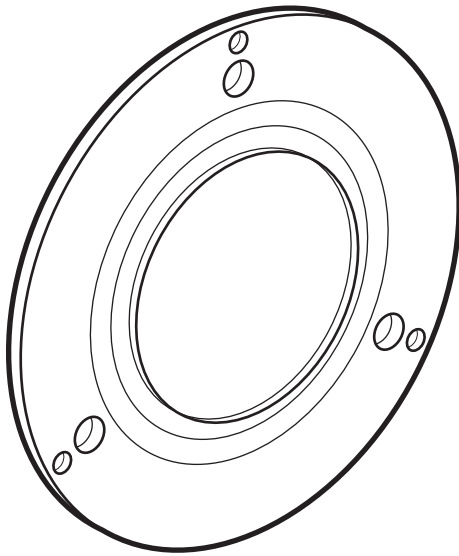
**⚠ CAUTION:** The rear of the Panaray LT loudspeakers can become extremely HOT during normal use. Do not attempt to service the loudspeakers until they have cooled to room temperature.

1. Turn off the amplifier power.
2. Disconnect the loudspeaker input connection.
3. Remove the 12 screws from the rear cover of the loudspeaker and slide the rear cover up and remove it from the cabinet.
4. Disconnect the blue wire from the positive (+) terminal and the black wire from the negative (-) terminal of the t1.4hp driver.

**🎵 Note:** On some models, the connectors may be lightly soldered to the terminals on the compression driver so removing the connectors may require a soldering iron.

5. Remove the four screws holding the compression driver assembly to the cabinet.
6. Remove the four countersunk screws that connect the mounting plate to the compression driver.
7. Connect the new compression driver to the mounting plate using the four countersunk screws.
8. Insert the compression driver assembly into the rear of the loudspeaker cabinet and secure with four screws.
9. Reconnect the blue wire to the positive (+) terminal and the black wire to the negative (-) terminal.
10. Replace the rear cover and secure it with the 12 screws.
11. Reconnect the loudspeaker input signal to the Speakon™ connectors.
12. Turn on the amplifier.

## To Replace the t1.4hp High-frequency Compression Driver Diaphragm



Replacement diaphragm for the t1.4hp high-frequency compression driver

To remove the compression driver from the loudspeaker cabinet:

1. Select a clean, well lit work area that is free of magnetic materials that might be attracted to the magnet in the compression driver.

♪ **Note:** Do not let any dirt or dust come in contact with the replacement diaphragm.

2. Carefully clean the outside of the compression driver with a damp cloth.
3. Place the rear of the driver facing up.
4. Remove the three 5.32" stainless steel hexhead screws and lock washers with a 5.32" hex wrench by first loosening each screw one turn. Then alternate loosening each screw until they are removed from the rear cover.
5. Gently lift the rear cover straight up. Set it down on its outside to keep the inside clean.
6. Remove the black diaphragm assembly by gently lifting and rotating it.
7. Examine the gap in which the coil of the diaphragm sits by completing the following:
  - A. Gently insert one end of a piece of clean paper (approximately 1" x 1.2") into the gap.
  - B. Slowly work the paper into the gap.
  - C. Move the paper around the perimeter of the gap.

♪ **Note:** You should not feel any debris or obstructions with the paper. If there is debris, use a piece of masking tape to remove. Fold the tape so that both sides have the adhesive backing on the outside. Insert the tape into the gap and work it into and around the gap, removing any debris.

- D. When the gap is clean, check once again with a clean piece of paper.

♪ **Note:** If the gap is still not clean, do not install the replacement diaphragm but instead, replace the entire compression driver.

8. Once the gap is clean, make sure that there is no debris on the front plate. The front plate may have some small smudges from fingerprints but there should be no debris (from a shattered aluminum diaphragm or any other source) and it should feel smooth to the touch with no pits in the metal.
9. Remove the replacement diaphragm from its carton.

♪ **Note:** Set it down so that the coil is facing up.

10. Grasp the diaphragm assembly around its edges and gently place it onto the front of the compression driver assembly. **Do not press down on the diaphragm assembly** (as this could cause the coil on the underside of the diaphragm assembly to be crushed against the front of the compression driver assembly).

11. Slowly and gently rotate the diaphragm assembly so that the coil is worked into the gap in the front of the compression driver, is centered in the gap, and the diaphragm assembly rests smoothly against the front plate of the compression driver. The screw holes in the diaphragm can be visually lined up with the screw holes in the front of the compression driver assembly to help center the coil into the gap.
12. Align the holes in the diaphragm assembly with the holes in the front of the compression driver assembly.
13. Place the rear cover back on by aligning the three screw holes and the three post holes.

 **Note:** Make sure the assembly fits together, is flush, and the holes align.

14. Place a screw with lock washer into each of the three holes.
15. Apply a sine-wave to the driver at a frequency of 300Hz and a maximum amplitude of 2 volts. The unit should produce a tapping sound, not a buzzing sound. If you hear a buzzing sound, center the diaphragm coil in the gap until the buzzing sound goes away.
16. Slowly tighten the three screws, alternating turns so there is even pressure on the back cover. If you hear a buzzing sound as you tighten, back off the screws until the buzzing sound goes away. Resume tightening the screws, paying attention to alternately tightening each screw the same number of turns. Tighten each screw to a maximum torque setting of 25 inch-pounds.
17. Sweep the frequency of the sine-wave from 300Hz to 1kHz and listen for buzzing. If you hear buzzing, readjust the diaphragm or clean the gap again. Dirt and/or misalignment of the diaphragm causes buzzing. Continue sweeping the frequency until you do not hear any buzzing. The driver is ready to use.

### To Replace the V-2 Mid-frequency Driver in the Panaray® LT 3202® -III

**⚠ CAUTION:** The rear of the Panaray LT loudspeakers can become extremely **HOT** during normal use. Do not attempt to service the loudspeakers until they have cooled to room temperature.

1. Turn off the amplifier power.
2. Disconnect the loudspeaker input connection(s).
3. The LT 3202-III uses a total of four V2 drivers. Remove the four screws securing each V2 driver to the cabinet.

**⚠ CAUTION:** Be careful not to let the driver fall out of the cabinet.

4. Disconnect the following:
  - For the top/first V2, disconnect the BLUE (+) and BLACK (-) wires connected to the driver.
  - For the second V2, disconnect the RED (+) and BLUE (-) wires connected to the driver.
  - For the third V2, disconnect the BLUE (+) and BLACK (-) wires.
  - For the bottom/fourth V2, disconnect the RED (+) and BLUE (-) wires.
5. Replace the damaged V2 driver.
6. Make the following connections:
  - For the top/first V2, connect the BLUE (+) and BLACK (-) wires connected to the driver.
  - For the second V2, connect the RED (+) and BLUE (-) wires connected to the driver.
  - For the third V2, connect the BLACK (+) and BLUE (-) wires.
  - For the bottom/fourth V2, connect the RED (+) and BLUE (-) wires.
7. Secure each V2 driver to the cabinet with the four screws (on each V2).
8. Reconnect the input connections.
9. Turn on amplifier power.



## **To Replace the V-2 Mid-frequency Driver in the Panaray® LT 4402® -III, LT 9402™ -III or LT 9702® -III Loudspeakers**

1. Turn off the amplifier power.
2. Disconnect the loudspeaker input connection(s).
3. The LT 4402-III, LT 9402-III and LT 9702-III use two V2 drivers. Remove the four screws securing each V2 driver to the cabinet.

**⚠ CAUTION:** *Be careful not to let the driver fall out of the cabinet.*

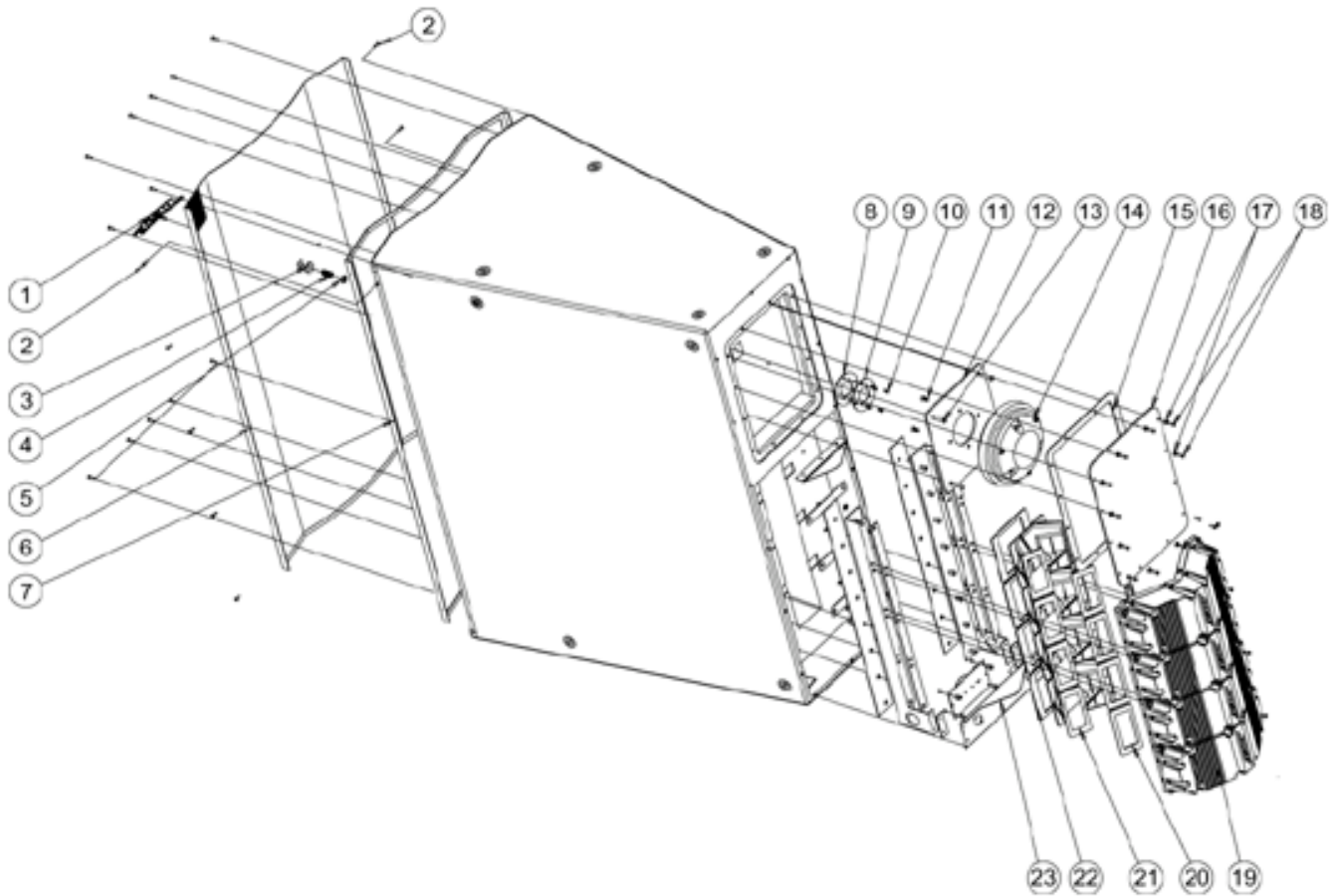
4. Disconnect the following:
  - For the top V2, disconnect the RED (+) and BLUE (-) wires connected to the driver.
  - For the bottom V2, disconnect the BLACK (+) and BLUE (-) wires.
5. Replace the damaged V2 driver.
6. Make the following connections:
  - For the top V2, connect the RED (+) and BLUE (-) wires connected to the driver.
  - For the bottom V2, connect the BLUE (+) and BLACK (-) wires.
7. Secure each V2 driver to the cabinet with the four screws (on each V2).
8. Reconnect the input connections.
9. Turn on amplifier power.

### ***To Replace the 12" Woofer in the Panaray LT MB24-III Modular Bass Loudspeaker***

1. Turn off amplifier power
2. Disconnect the loudspeaker input connection(s)
3. Remove the 22 screws securing the grill to the enclosure. Lift the grill off of the enclosure.
4. Remove the 8 screws securing the driver to the enclosure.
5. Lift the driver out of the enclosure.
6. Remove the old gasket.
7. Disconnect the RED (+) and BLACK (-) wires connected to the driver.
8. Replace gasket.
9. Make the following connections to the new driver:
  - Connect the RED (+) and BLACK (-) wires connected to the new driver.
10. Insert new driver to the cabinet and secure with the 8 screws.
11. Reconnect the input connections.
12. Turn on amplifier power.

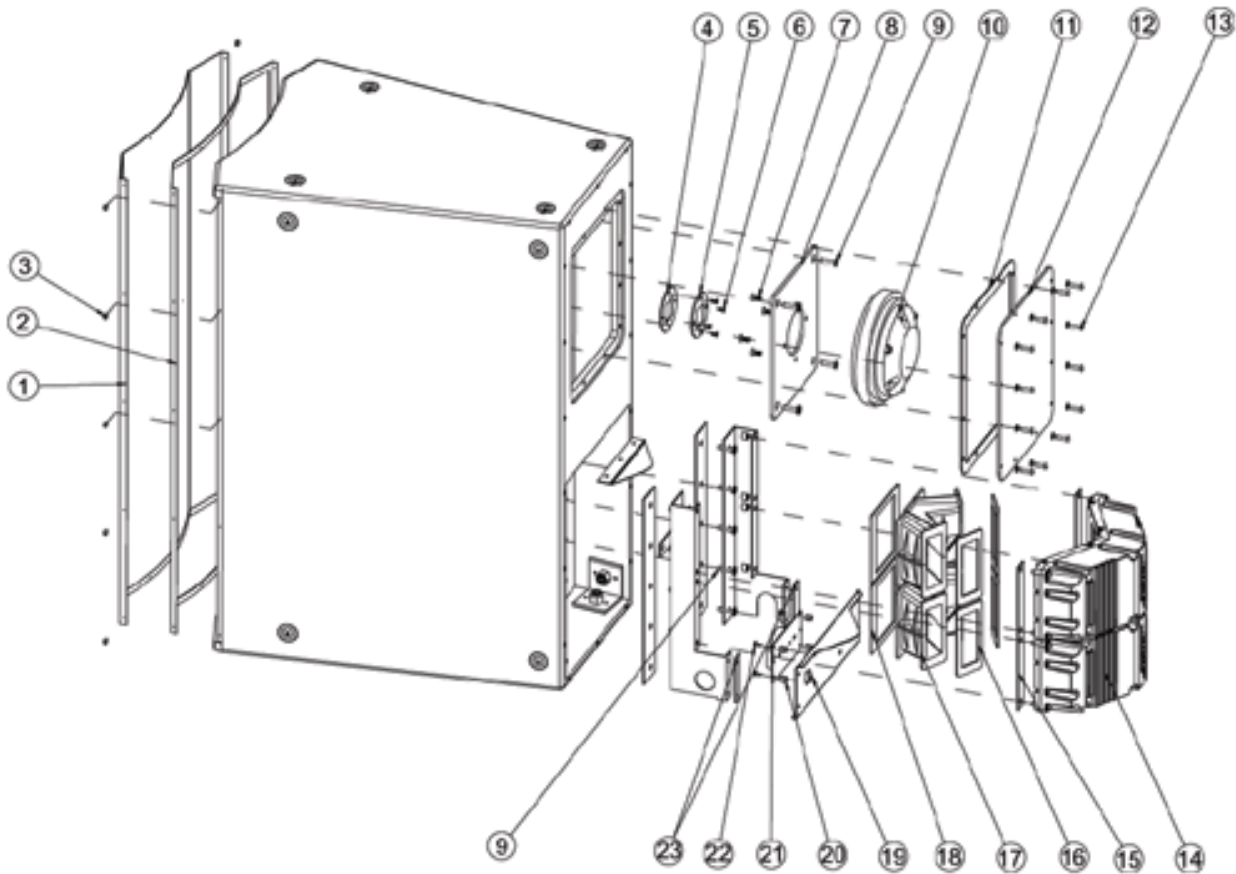
## Driver and Electronics Assembly

### LT 3202®-III Loudspeaker



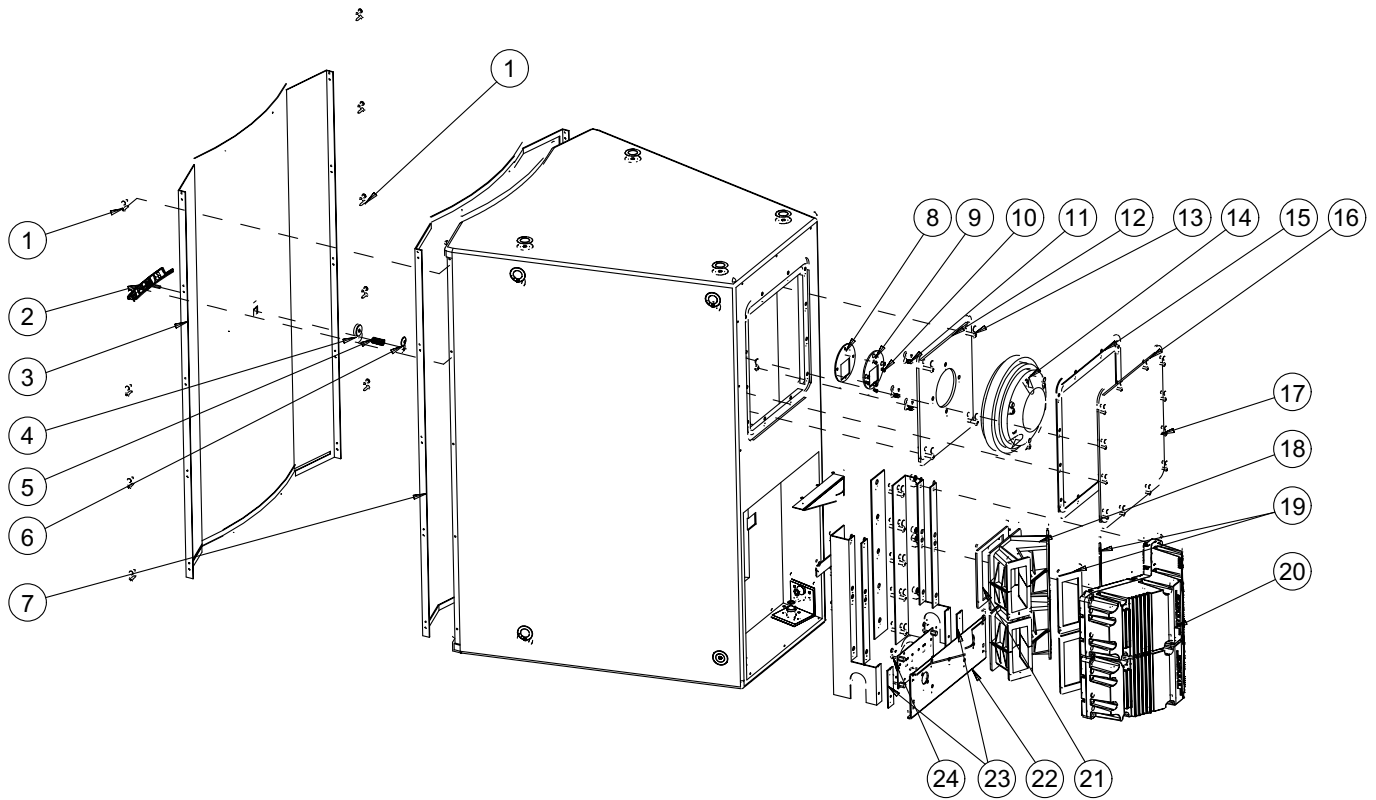
1	Logo, Panaray LT	9	Disk, Align, Compression Driver	17	Washer
2	Kit, Grille Screw, TA 4x15 (14 screws per kit)	10	Screw, KM 4x12	18	Screw TM 4x15
3	Cap, Spring	11	Screw, KM 6x12	19	V2 Assembly
4	Spring, Logo	12	Plate, Mount, Compression Driver	20	Gasket, Input Manifold
5	Clip, Retaining, Logo	13	Screw, TM 6x30	21	Manifold, V2
6	Grille Assembly, includes: screws, tape, logo, fastener and spring	14	Compression Driver	22	Gasket, Output Manifold
7	Gasket, Grille	15	Gasket, Rear Panel	23	Input Panel with Crossover PCB
8	Gasket, Compression Driver 1	16	Panel, Rear		

## LT 4402® -III Loudspeaker



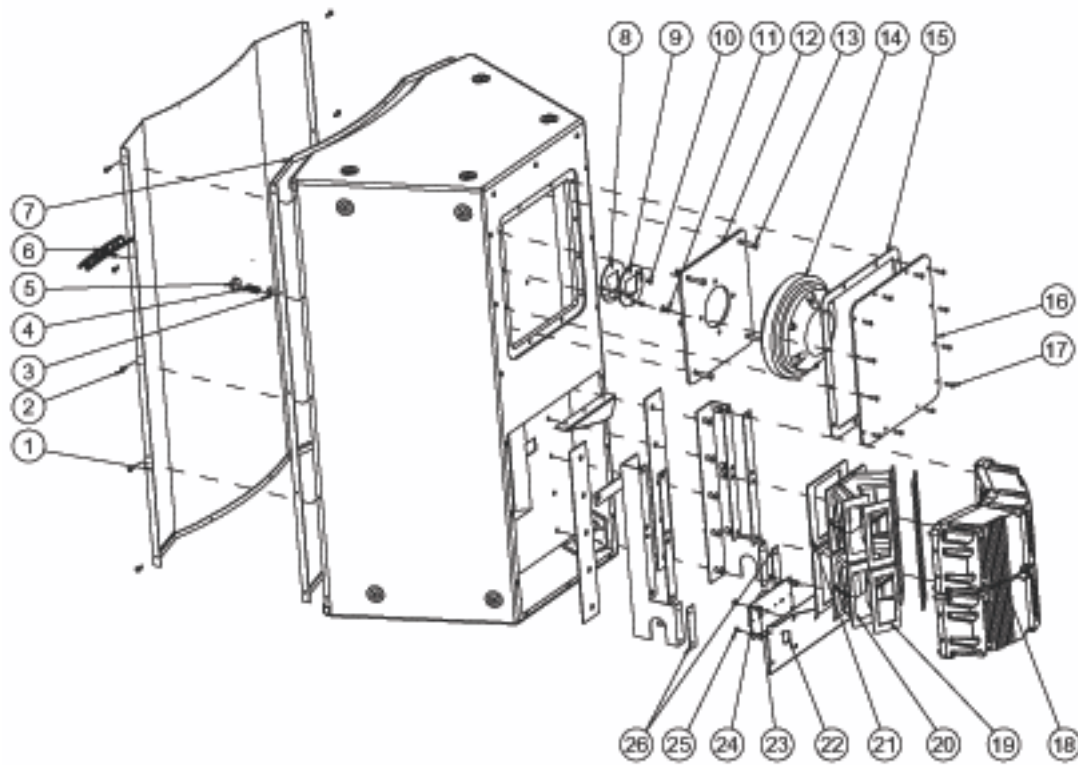
1	Grille Assembly, includes: screws, tape, logo, fastener and spring	9	Screw, TM 6x30	17	Manifold, V2
2	Gasket, Grille	10	Compression Driver	18	Gasket, Output Manifold
3	Kit, Grille Screw, TA 4x15 (14 screws per kit)	11	Gasket Panel	19	Panel, Input
4	Gasket, Compression Driver	12	Panel, Rear	20	Standoffs for Crossover PCB
5	Disk, Alignment, Compression Driver	13	Screw TM 4x15	21	Input Panel with Crossover PCB
6	Screw, KM 4x12	14	V2 Assembly	22	Screw, KM 3x12
7	Screw, KM 6x12	15	Gasket, Upper Flange	23	Gasket, Input Panel
8	Plate, Mount, Compression Driver	16	Gasket, Input Manifold		

LT 9402™-III Loudspeaker



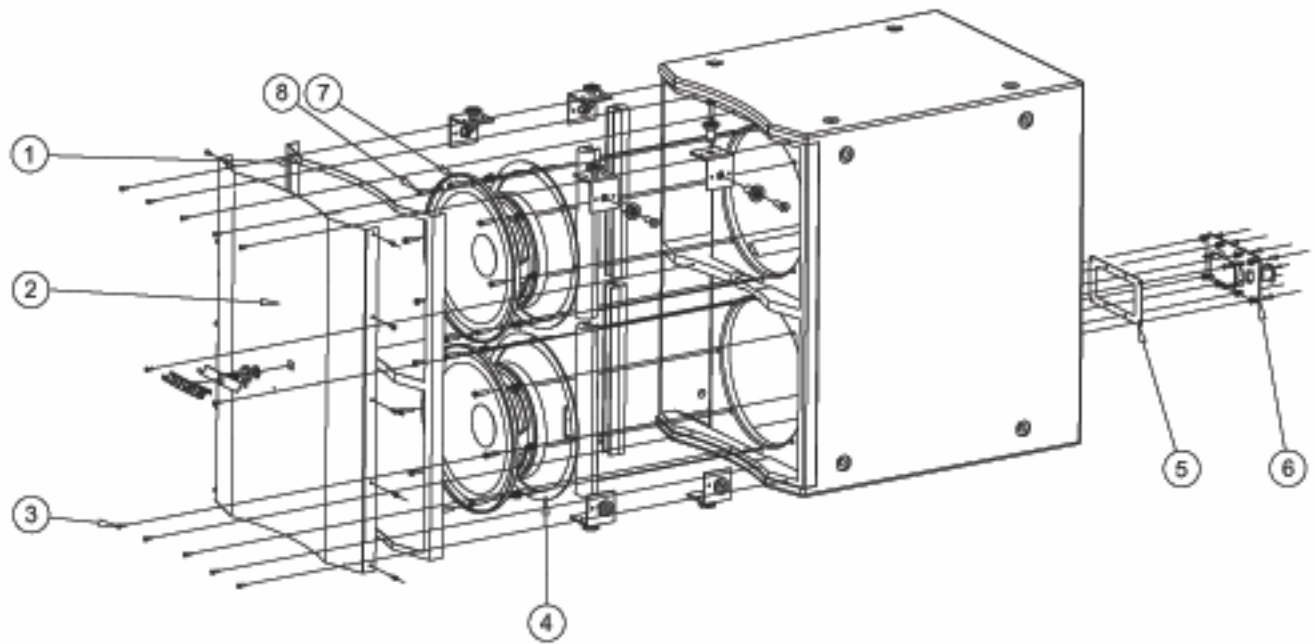
1	Kit, Grille Screw, TA 4x15 (14 screws per kit)	9	Disk, Alignment, Compression Driver	17	Screw, TM 4x15
2	Logo, Panaray LT	10	Screw, KM 4x12	18	Manifold, V2
3	Grille Assembly, includes: screws, tape, logo, fastener and spring	11	Screw, KM 6x12r	19	Gasket, Input Manifold
4	Cap, Spring	12	Plate, Mount, Compression Driver	20	V2 assembly
5	Spring, Logo	13	Screw, TM 6x30	21	Gasket, Output Manifold
6	Clip, Retaining, Logo	14	Compression Driver	22	Panel, Input with Crossover
7	Gasket, Grille	15	Gasket, Panel	23	Gasket, Input Panel
8	Gasket, Compression Driver	16	Panel, Rear	24	Screw, KM 3x12

## LT 9702® -III Loudspeaker



1	Grille Assembly, includes: screws, tape, logo, fastener and spring	10	Screw, KM 4x12	19	Gasket, Input Manifold
2	Kit, Grille Screw, TA 4x15 (14 screws per kit)	11	Screw, KM 6x12	20	Manifold, V2
3	Clip, Retaining, Logo	12	Plate, Mount, Compression Driver	21	Gasket, Output Manifold
4	Spring, Logo	13	Screw, TM 6x30	22	Panel, Input with Crossover
5	Cap, Spring	14	Compression Driver	23	Standoffs for Input Panel PCB
6	Logo, Panaray LT	15	Gasket, Panel	24	Input Panel, PCB
7	Gasket, Grille	16	Panel, Rear	25	Screw, KM 3x12
8	Gasket, Compression Driver	17	Screw, TM 4x15	26	Gasket, Input Panel
9	Disk, Alignment, Compression Driver	18	V2 Assembly		

**LT MB24-III Loudspeaker**



1	Gasket, Grille, MB24 Bass Module	5	Gasket, Input Panel
2	Grille Assembly, includes: screws, logo, tape, fastener and spring	6	Input Panel Kit
3	Grille Screw Kit (14 screws)	7	Woofer Assembly, 12-inch, TBX
4	Gasket, Woofer	8	Screw, Woofer

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